

Newark - Division of Water

DEPARTMENT OF PUBLIC AFFAIRS
CITY OF NEWARK, NEW JERSEY
ANNUAL REPORT
OF THE
DIVISION OF WATER
FOR
1937

ANNUAL REPORT
OF THE
DIVISION OF WATER

Mr. James W. Costello, Chief Engineer
Department of Public Affairs
Newark, New Jersey

Dear Sir:

The annual report of the various Bureaus of the Division of
Water for the year 1937 is herewith submitted.

Respectfully,

WCB:FM

WILLIAM G. BANKS
DIVISION ENGINEER

ANNUAL REPORT
OF THE
BUREAU OF WATER SUPPLY
(DIVISION OF WATER)

FOR 1937

BUREAU OF WATER SUPPLY
COVERING
COLLECTION, PURIFICATION, TRANSMISSION AND CEDAR GROVE RESERVOIR
FOR YEAR 1937.

ALFRED B. ANDERSON

ASSISTANT ENGINEER - IN CHARGE

C O L L E C T I O N

PRECIPITATION ON PEQUANNOCK WATERSHED

The precipitation on the Pequannock Watershed as determined from the average of observations at three locations, Canistear, Oak Ridge, and Charlotteburg, amounted to 56.74 inches for the year 1937. This is considerably above the normal, which for the years of record since 1893 is 48.62 inches. The rainfall was well distributed through the year. December, with 2.50 inches of rain, was the driest month and August with 7.23 inches of precipitation was the wettest.

STORAGE AND DEPLETION - PEQUANNOCK RESERVOIRS.

The amount of water stored in the Pequannock Reservoirs on January 1, 1937 amounted to about 9700 million gallons, a depletion of about 2400 million gallons. At no subsequent time during the year was this depletion figure approached. By the first of February 1937 all reservoirs were full and they remained so until early in July. From that date the storage was slowly depleted, with one minor interruption due to heavy downpours late in August, until the middle of October when the amount of water in storage had decreased to 10,300 million gallons, a depletion of about 1900 million gallons. Thereafter the storage increased quickly and by the first of December all reservoirs were again full, to remain so till the end of the year.

WATER DIVERSION

A total of 13,437.7 million gallons of water were diverted from the Pequannock Watershed during 1937 as contrasted with 13,686.1 million gallons in 1936,

a decrease of 250.4 million gallons.

From Wanaque Reservoir 7,901.5 million gallons of water were taken by Newark in 1937 as compared with 7507.2 million gallons in 1936, an increase of 394.3 million gallons.

Month by month figures of the amount of the 1937 diversions are shown on the last two columns of Table II of this report.

The Pequannock diversion figures differ from the figures of consumption of Pequannock water by the amount of the gain or loss in storage in Cedar Grove Reservoir. The total consumption of Pequannock water as seen in the next paragraph is greater than Pequannock diversion by 3.9 million gallons, which agrees closely with the net loss in Cedar Grove Reservoir storage during the year 1937.

WATER CONSUMPTION

The total consumption of water in the Newark system for the year 1937 was 21,243.1 million gallons, an average of 58.2 million gallons daily, an increase of 86.3 million gallons or .4 million gallons daily, from the 1936 figures of 21,156.8 million gallons total for the year and 57.8 million gallons daily. Of this 13,441.6 million gallons (36.8 million gallons daily) were from the Pequannock supply and 7801.5 million gallons (21.4 million gallons daily) from the Wanaque supply as compared with 13,649.6 million gallons (37.3 million gallons daily) from the Pequannock in 1936 and 7,507.2 million gallons (20.5 million gallons daily) from the Wanaque in 1936.

Of the total 1937 consumption of 58.2 million gallons daily 48.2 million gallons daily were consumed in Newark and 10.0 million gallons daily were delivered to other systems. For details see Tables No. I and No. II of this report.

PEQUANNOCK WATERSHED

THOMAS P. BYRNES, SUPERINTENDENT

In addition to the regular routine which was carried out, the following extra work was accomplished:

RESERVOIRS

Brush was cut and burned around the shore lines of Canistear, Clinton, Oak

Ridge and Echo Lake Reservoirs, and all ponds and the shore lines cleaned. The gate houses at Oak Ridge, Clinton, Canistear and Echo Lake were repaired and painted. The rip-rap on Oak Ridge overflow was relaid and all dead trees were cut and removed from the approach of Oak Ridge dam.

STREAMS

Brush was cut and cleaning done along the banks of the following streams; Canistear, Oak Ridge, Clinton, Echo Lake, Dunker Pond, Williamsville, Cotters, Wallace, Uttertown, Falls, Vanderhoff, Timberbrook, Charlotteburg and the entire Pequannock River. Clinton stream, Wallace Pond and Harls Pond were treated with copper sulphate. The pre-chlorinating station was used on Kanouse Brook during the summer months.

SANITATION

Frequent and rigid inspections were made of all properties within the watershed. Garbage was collected throughout the entire area and disposed of at the incinerator. New septic tanks were installed at Schaffer's Road Stand, Leo Little's, Kirberry's, Lewis' Road Stand and at Hopper's Garage. All toilets and cess-pools were cleaned and eight new toilet vaults were installed. The toilet cans of the Civilian Conservation Corps and the Dutch Elm crews were collected and cleaned daily. Repairs were made to the disposal plant at New City.

INSPECTION

The usual watershed patrol was maintained with horses and cars, toilets and premises were inspected, streams walked, tree plantations guarded, trespassing prevented and recreation centers supervised.

FIRE INSPECTION

An independent inspection of city-owned buildings on the watershed was made with a representative of the Fire Department of the City of Newark.

RECREATION CENTRES

Three large parks for picnic parties were maintained.

FOREST FIRES

An exceptionally fine record was maintained during the year on fires. Seven were reported - two along railroad lines and five others. The total area burned over was 19 acres. Fire lanes were plowed around pine groves.

CITY OWNED BUILDINGS

Minor repairs were made on many buildings. Houses No. 70-A and 443 were repainted. The barns and windmill at House No. 7 at Charlotteburg, barns at House No. 443 at Canistear and House No. 177 at Newfoundland were razed. Garage to replace the barn at House No. 443 at Canistear was built, also one at House No. 171 (Heilman).

CORDWOOD AND PILES

Sales of cordwood were at a minimum, due to decreased cutting by the Civilian Conservation Corps. One thousand, one hundred and eighty-nine (1189) cords were furnished to relief organizations for distribution to the poor in Newark. A total of 397 piles were supplied to the Newark Airport.

CIVILIAN CONSERVATION CORPS WORK

Two camps were maintained in the watershed up to December 10th at which time Camp S 70 was abandoned. Three swamps, Irwin, Gould Mountain and lower Echo Lake were ditched. Total swamp area 300 acres. Forest stand improvement was done on 603 acres. 370,000 trees were planted of which 330,000 were raised in our own nursery. In addition 40,000 walnuts were planted and 382,000 seedlings removed to transplant beds. An inventory made this fall shows 2,578,000 trees in the nursery. A new chestnut fence was erected around the nursery. 1.5 miles of horse trails were completed and 3.7 miles of roads completed, i.e., the road along Echo Lake Brook and one on the old Brown property at Stockholm. A new 80 foot steel fire observation tower was erected by Camp S 70 on private property off the watershed.

SAFEGUARDING AND PURIFICATION

CEDAR GROVE LABORATORY
J.F.D. BAUMANN
ASSISTANT BACTERIOLOGIST IN CHARGE

The procedures of the American Public Health Association and the United States Public Health Service, supplemented by methods found better adapted to our own supply, were followed in the laboratory. The latter methods serve the purpose of checking the former. The following samples from various sources were examined.

<u>Source</u>	<u>Microscopical</u>	<u>Bacteriological</u>
Station #1 and 2 Great Notch	600	600
Station #3 Cedar Grove Reservoir Effluent	300	300
Station #6 Belleville Reservoir Area	296	259
Station #7 Manaque at Belleville	300	294
Station #8 So. Orange Ave. Reservoir Area	71	246
Station #9 Central Avenue and Ninth Street	---	55
Station #15 Macopin Intake	52	51
Station #17 Echo Lake Brook	52	51
Station #20 Kanouse Brook Area	63	72
Station #25 Clinton Brook	52	51
Station #30 Oak Ridge Brook	53	51
Cedar Grove Reservoir Proper	30	---
New Pipe Lines in Newark	---	208
Pipe Line Great Notch to Belleville	---	9
City Taps in Newark	92	97
Town of Belleville Taps	4	10
Town of Bloomfield including Carrabrant Avenue	10	18
Special Samples & Complaints	24	31
Watershed Wells	4	23
Earl Pond	4	---
Wallace Pond	2	---
Stockholm Brook	1	---
Echo Lake Reservoir	2	---
Pequannock River	2	---
Greenwood Pond	1	---
Cotter Brook	1	1
Brook from Brown Property	---	1
TOTAL	2016	2428

CHEMICAL SAMPLES

12 Monthly Chemical Analyses complete of Delivered Pequannock Water
 1 Fertilizer
 10 Copper in Water
 1 Aluminum in Water
 1 Well Water
 5 Boiler Waters

In addition to the above chemical analyses there were a large number of pH values determined and free chlorine carbon dioxide and dissolved oxygen performed in the laboratory.

MICROSCOPY

<u>Source</u>	<u>Date Treated</u>	<u>Date Treatment Stopped</u>	<u>Microorganisms</u>
Cedar Grove Reservoir	May 26	May 26	Tabellaria
Belleville Reservoir	May 27	May 27	"
Cedar Grove Reservoir	June 2	June 2	Tabellaria Daphnia
Earl Pond	June 3	June 3	Hydra & Rotifera
Belleville Reservoir	June 5	June 5	Tabellaria
Nacopin Intake	June 28 (Manual)	Sept. 3	Anacharis & Weed
Charlottesville, Kanouse and Oak Ridge	July, August & September (Manual)		" "
Clinton Brook	Sept. 21	Oct. 11	Algae
Cedar Grove Reservoir	Oct. 11	Oct. 11	Synedra

In the above locations, copper sulphate was used to treat the troublesome microorganisms.

In June the usual complaint of Branchipus appearing at different parts of the city was noted. The screens and sediment in the West Gate House at Cedar Grove Reservoir were examined for Branchipus, but none could be found. A trap was placed at the venturi meter for the summer months, but not one Branchipus was found. It is believed that they are located in one of our distribution lines in the city.

During June a number of fish were found dead in Earl Pond and a known enemy of fish, the Hydra, was found. These Hydra were killed by copper-sulphate treatment and the trouble eliminated.

An unusual increase of weed in some streams on the upper limits of the watershed was observed. Treatment by chemicals could be resorted to, but is not advised to any great extent as it will affect the aesthetic quality of the water. It is understood that it is nearly fifteen years since there has been an accumulation of weed like that found in the Intake. Charlottesville, Upper Oak Ridge and the Williamsville Sections.

BACTERIOLOGY

On April 22nd a sudden outbreak of dysentery in the Town of Belleville occurred. The water supply was suspected and on April 23rd samples of water were taken throughout the town. The water supply was found in no way to blame, and the trouble was traced to a bakery in the town where a woman who had symptoms of dysentery, was employed.

It should be noted that the Town of Belleville was laying new water mains at the time and did not resort to chlorination before putting these mains in service. It so happened these mains were not polluted, but the Health Officer was advised to warn the Belleville Water Department of the danger in placing water mains in service without chlorinating them.

A letter from Dr. Charles V. Craster, Health Officer of Newark was received on August 2nd relative to pollution in Manouse Brook. The results of laboratory tests showed the water from this area to be no worse than it was some years ago. We did chlorinate as an added precaution but our only remedy in this area is to purchase those properties causing pollution.

The City Board of Health of New York City advised that samples of water taken from a premises on Elizabeth Avenue, Newark, showed pollution. An investigation was made but no pollution could be found at the time. Subsequent weekly tests at this place have not shown any pollution.

CHEMISTRY

In January a piece of copper tubing was referred to the laboratory for analysis of a green deposit present inside. The tubing was obtained from an area that had been supplied with Wanaque water. Until an investigation was made the use of copper tubing in the system was discontinued. The results of tests conducted over a period of three months showed that there was not enough copper present in the water to do any harm and that it was well within the limit set by the United States Treasury Department. The ban on copper tubing was then lifted.

A complaint of aluminum poisoning was received from a representative of a Chemical Company blaming the water supply. It was thought by the complainant that spraying of trees in the watershed contaminated the water. Investigation showed no spraying had been done involving the use of aluminum.

The pH value of the water entering Oak Ridge Reservoir on September 23th was unusually high. The high pH value was traced to a limestone quarry beyond the limits of Canistota Reservoir Area near the Margerum property.

WATER TREATMENT - SANITATION

Ortho-tolidine tests for free chlorine reaction are made hourly on both pipelines at Macopin Intake. These were further checked at Great Notch by the laboratory. Daily chlorine tests were also made at Cedar Grove, South Orange Avenue and Belleville Reservoirs, while their chlorine plants were in operation.

Chloromine treatment was used at Macopin Intake from May 10th to November 3rd, and the rest of the year straight chlorine was used.

The effluent of Cedar Grove Reservoir was chlorinated with straight chlorine from June 25th to June 19th to control daphnia and cyclops that are present around this time of year.

In the middle of June Belleville Reservoir was cleaned but due to bacterial flora had to be treated daily at the influent with C.C.H. solution and ammonia. On July 31st a Wallace and Tiernan Vacuum Feed Chlorine machine was installed and chlorine gas used instead of C.C.H. solution. Treatment at this reservoir was discontinued on November 4th.

On June 1st treatment at the influent of South Orange Avenue Reservoir with C.C.H. solution and ammonia was started. On July 8th a Wallace and Tiernan Vacuum Feed Chlorine machine was installed and straight chlorine gas used instead of C.C.H. solution. It so happened on this same day that the draft on this reservoir was unusually heavy and it was found that the water was free from gas tubes when the reservoir was taxed to its capacity. Treatment at South Orange Avenue Reservoir was discontinued on November 8th when the reservoir was by-passed for cleaning. This reservoir was again placed in service on November 10th after C.C.H. treatment. Daily treatment of the reservoir at this time was not needed.

The treatment of Belleville and South Orange Avenue Reservoirs was experimental and various ways and means were used in treating.

The removal of aquatic and land weed from Macopin Intake, Charlotteburg Pond and Upper and Oak Ridge greatly improved the aesthetic quality of the delivered water.

During the summer months the Civilian Conservation Corps made a much needed improvement in the watershed by ditching Irwin Meadow and Hancock Brook. They could however have better cooperated in notifying the intake of the sudden

stored quantities of water in those areas, so that adjustments could have been made in the chlorine dosage, when these waters were released each day. If this work is continued efforts should be made to eliminate the excess turbidity caused by the sudden release of large quantities of these stored waters.

Lawrence Brook at Hingham was chlorinated from August 5th to October 15th, except for a short period when there was a shortage of chlorine.

The chlorination of all new pipe lines in the system was placed under the supervision of the laboratory on September 13th.

WATER SUPPLY

Daily bacteriological, microscopical and chlorine residual tests were made of the Wausau Supply at the Belleville takeoff, as in previous years.

Complaints of dirty water in the West Newark section were not due to the quality of the Wausau Supply, but are the results of lack of enough circulation.

Until ice at the Wausau Reservoir melted it was impossible to treat the microorganisms that caused strong odors in the early spring.

TRANSMISSION LINES AND CEDAR GROVE RESERVOIR ALFRED D. ANDERSON ASSISTANT ENGINEER

During the year the usual work necessary to maintain and operate the 68.43 miles of steel transmission pipe lines has continued.

The entire transmission system was carefully patrolled each week to locate any possible sources of trouble that might interrupt the supply to the city. All air valves were operated to release any entrapped air, and all valves, structures, etc. were carefully inspected. During the year 11 leaks were reported and repaired.

An additional air release valve was placed on the No. 1 line at Becker Road, Butler, and an 8" x 8" tee was installed below the air release valve to assist in releasing the air at this point when filling the No. 1 line.

The two pipe tunnels on the 60-inch Elizabeth line were inspected and both tunnels and the pipe in the tunnels were found in good condition.

MAINTENANCE OF RIGHT OF WAY

During the year it was necessary to rebuild two dry masonry retaining walls along the right of way at Pompton Notch. The grass along the right of way was mowed and the cross ditches cleaned when necessary.

CEDAR GROVE RESERVOIR

As in the past the work in connection with maintaining the grounds and buildings on the Cedar Grove Reservation has continued. The grass on the dams and around city buildings was mowed during the summer months. Four hundred and eighty (480) evergreens were transplanted from the nursery to other points in the reservation.

At the direction of the chemist the reservoir was treated with copper sulphate on two occasions.

With the aid of W.P.A. labor it was possible to build a rubble retaining wall on the east side of Reservoir Drive for practically its entire length. This wall was needed to prevent the caving in of the roadway for a distance of about 6,000 feet.

On Ridge Road, at the southerly end of the Reservoir, the side walls for a distance of 1400 feet was raised about 20 inches and sloped to the gutter. After grading, sod was placed to prevent washing. This work was done to prevent the wash from the pavement flowing into the reservoir.

NEW CONSTRUCTION

A contract was let to H.L.Harrison and Son, Inc. in October, for the construction of a 48-inch electric welded steel pipe line, joined by Dresser couplings, extending from Belleville Reservoir to Mill Street, Belleville. Work on the contract started in November and during the balance of the year 1400 feet of pipe were laid.

City forces riveted 4- 20" steel saddles to the No.2 Pequannock line for the connections to the new line.

ENAMEL LINING
(PIPE PROJECTS ADMINISTRATION)

In December this year the Reconditioning of the No.2 Pequannock pipe line from Belleville Reservoir to Broad Street, Clifton, was practically completed. The enamel lining was placed in 3,000 feet of pipe, making a total of 19,340 feet. This work will be completed in January 1933, after which the pipe line will be chlorinated and put in service. Preparations are being made to recondition the No.1 Pequannock line from Broad Street, Clifton, to Belleville Reservoir, immediately thereafter.

WOOD STAVE LINE

The wood stave line was used only for operating the chlorine machines at Macopin. Although numerous leaks have developed in the line it is not advisable to try caulking them. The wood has so deteriorated that additional leaks develop as soon as caulking is attempted.

MACOPIN INTAKE

In June of this year a heavy growth of plant life in Macopin Intake necessitated draining the reservoir and cleaning the bottom. The plant growth was raked and carried out of the reservoir and the mud in the channel washed through the gate house out to the river.

In October this year a new ice boom was built in front of the Macopin Gate House.

CHLORINE PLANT

An extension was built on the chlorine plant. The additional room was needed for use as a field laboratory.

A shed was also constructed over the one-ton chlorine cylinders to protect them from the direct rays of the sun.

ANNUAL REPORT
OF THE
BUREAU OF RECLAMATION
(DIVISION OF WATER)
FOR 1937

BUREAU OF DISTRIBUTION

ROBERT O. SCHOLZ, ENGINEER IN CHARGE

ARTHUR J. SIMPSON, ASSISTANT ENGINEER

During the year 1937, all but necessary expenditures by Division of Water forces, for construction and maintenance work in the Distribution System, were curtailed.

Budget figures were again held to an absolute minimum.

Practically all main replacements and extensions in the system during the year, were made as Works Progress Administration Projects, under our supervision.

The following is a summary of the most important work accomplished by the Bureau of Distribution during the year.

Continuance and completion of certain Works Progress Administration Projects started in 1936. This work included the following:

MAINS LAID - LOW PRESSURE

	<u>Length</u>	<u>Size of Main</u>
North 10th Street - Delavan Avenue to Lake Street	492'	12"
Lake Street - North 10th Street to Monias Street	450'	12"
Davenport Avenue - North 6th Street to North 10th St.	1180'	16"
Davenport Avenue - North 10th Street to Heckel Street	745'	12"
Delmont Avenue - Clinton Avenue to Poddie Street	2725'	16"

MAINS RELAID - LOW PRESSURE

North 10th Street - Davenport Avenue to Delavan Avenue	847'	12"
Doramus Avenue - Raymond Boulevard south 3,000 feet	3020'	20"
Doramus Avenue - Wilson Avenue north 1,400 feet	1400'	20"

(Note: - Work on this Doramus Avenue 20-inch main, which was started in December 1936, was carried on until April 1937, when W.P.A. funds were exhausted. A supplemental project to complete the work was not approved until December 1937, when the work was continued. This project will be completed in 1938.)

Hydrant Painting - This work included the cleaning and painting of all hydrants in accordance with the new color combinations recommended by the Water Works Committees, to indicate their relative available fire service draft, which is of substantial value to the Division of Water and the Fire Department.

All low pressure hydrant barrels, regardless of class are painted chrome yellow, with the following identifying color combinations.

Class A - Flow capacity of 1000 gallons per minute or greater - Tops and Nozzle Caps - Green.

Class B - Flow capacity of 500-1000 gallons per minute-Tops and Nozzle Caps - Yellow.

Class C - Flow capacity of less than 500 gallons per minute - Tops and Nozzle Caps - Red.

These colors conform to those used in traffic signal work for safety, intermediate and danger.

Hydrant Flow Tests - This work was conducted primarily to determine hydrant capacities throughout the system in advance of painting our hydrants in accordance with color combinations, which will visually indicate their relative available fire service draft, as recommended by Committees on Hydrant Markings of the American and New England Water Works Associations. Capacities are rated based on a residual pressure of 20 pounds per square inch.

These flow tests have also proved invaluable to us in establishing the strength of the distribution system.

The following two W.P.A. Service Projects were continued during the entire year 1933.

Location of Consumers' Services - This project started in 1935 was continued throughout the entire year. The work includes a check of all office records, a field survey and the preparation of standard service maps.

Leak Detection Survey - This work started in 1936 was continued throughout the year and is being conducted to determine and check water waste due to leakage, over the entire system. The work is being done at night, usually between 11:00 P.M. and 7 A.M., when there is a minimum of noise, by aquaphone and other leak detecting devices, and all house services, gate valves and hydrants are being checked by districts. The work also includes sewer man-hole investigations for further check. All leaks found are promptly reported,

and investigated and repaired by our own maintenance forces.

Additional work, covering water main extensions and replacements under approved W.P.A. Projects, was started and completed during the year 1936, listed as follows:

MAINS LAID - LOW PRESSURE

	<u>Length</u>	<u>Size of Main</u>
Hillside Avenue - Hooker Avenue to Watson Avenue	425'	16"
Hillside Avenue - Watson Avenue to Hawthorne Avenue	1035'	16"
Hillside Avenue - Hawthorne Avenue to Peddie Street	159'	16"
Watson Avenue across Hillside Avenue	68'	16"
Hawthorne Avenue across Hillside Avenue	57'	16"
Float Street - E.S. Sergeant Company to Bulkhead Street	837'	8"
North Bulkhead Street - Float Street northerly	156'	8"
South Dock Street - Coastwise Street to Export Street	1119'	10"
Second Avenue East - Clifton Avenue to Highland Avenue	742'	12"
Second Avenue East - Clifton Avenue to St. Prospect Ave.	395'	12"
Highland Avenue - Bloomfield Avenue to Second Avenue	910'	12"
Bergen Street - Renner Avenue to Hawthorne Avenue	1969'	12"
State Highway Route 25 - Haynes Avenue to South Zone St.	769'	30"
State Highway Route 25 - South Zone Street to Avenue I	7123'	30"
Bergen Street - Lyons Avenue to Renner Avenue	1691'	12"
Export Street - South Dock Street to Marsh Street	682'	12"
Marsh Street - Export Street easterly	218'	16"
Newark Airport-S.S. of Hangar & connecting up to existing 12" Main	1332'	12"
Davenport Avenue - North 6th Street to 60 ft. E. 5th St.	386'	12"
Newark Airport New Hangar W.S. Route 25 along the W.S. of	492'	12"
North 9th St.-6th Ave. to Park Ave. (Hangar)	855'	12"
Morris Avenue - Central Avenue to New Street	432'	12"

MAINS RELAID - LOW PRESSURE

Delavan Avenue across North 10th Street	73'	12"
Elliott Street - Sumner Avenue to Broadway	992'	8"
Stone Street - 7th Avenue to Bloomfield Avenue	2092'	8"
Garside Street - 6th Avenue to Bloomfield Avenue	1551'	8"
Johnson Street - Dawson Street to McWhorter Street	279'	12"
Johnson Street - Dawson Street to Pacific Street	484'	8"
Johnson Street - McWhorter Street to N.J.R.R. Avenue	957'	8"
Dawson Street - Johnson Street to South Street	669'	12"
Herron Street - Thomas Street to Johnson Street	1001'	3"
McWhorter Street - Johnson Street to Oliver Street	775'	12"
McWhorter Street - Oliver Street to Elm Street	1327'	8"
Murray Street - Pennsylvania Avenue to Clinton Avenue	927'	12"
Murray Street - Broad Street to Pennsylvania Avenue	403'	12"
Park Avenue - Lake Street to Clifton Avenue	1017'	12"
Highland Avenue - Park Avenue to Bloomfield Avenue	1767'	8"
Lillie Street - Waverly Avenue to 18th Avenue	682'	8"
Waverly Avenue - Lillie Street to Peshine Avenue	55'	8"
North 7th Street - Park Avenue to Sixth Avenue	860'	8"
Abbottsford Avenue - Sandford Avenue to Vail Street	738'	8"
Hazelwood Avenue - Cliff Street to South Orange Avenue	1003'	8"

The following main extensions and replacements under approved W.P.A. Projects were started in the latter part of 1937 to be completed in 1938.

MAINS BEING LAID - LOW PRESSURE

Sandford Avenue - Varsity Road to Netherwood Place

Size of
Main

12"

MAINS BEING REPAID - LOW PRESSURE

Sandford Avenue - Netherwood Place southerly to City Line

12"

New Street - Morris Avenue to Norfolk Street

12"

Doremus Avenue - 2930 feet S. Raymond Boulevard to 6330 ft. S. Raymond

20"

South 12th Street - South Orange Avenue to 13th Avenue.

Hlvd. 8"

In connection with all the Works Progress Administration Projects herein mentioned, a considerable amount of the materials and practically all of the labor, both unskilled and skilled, have been furnished as Federal contribution, resulting in a very material saving to the City of Newark.

WORK DONE BY REGULAR FORCES OF THE
BUREAU OF DISTRIBUTION

All necessary work in conjunction with Works Progress Administration Projects.

This work included preparation of Project application and plans, supervision, preparation of records, intersection hook-ups, service transfers and other skilled work.

In addition thereto the following main extensions and replacements were completed by our own forces.

MAINS LAID - LOW PRESSURE

	<u>Length</u>	<u>Size of Main</u>
So. Lane Street - Haybridge Extension (Bur. St. Cleaning)	493'	6"
Clinton Avenue - Palyan Place to Leslie Street	627'	8"
Hansbury Avenue - Parkview Terrace easterly	394'	8"
Hansbury Avenue - Aldine Street to Clinton Place	141'	8"
Lawrence Street, S.E.S. - Heckel Street to Belmont Avenue	302'	8"
Hoble Street - Frelinghuysen Avenue easterly	266'	6"

MAINS REPAID - LOW PRESSURE

Halstead Street - South Orange Avenue to Norwood Place	1002'	8"
Palm Street - Sanford Avenue E. to City Line	(1085'	8"
	778'	12"
Marion Avenue - Sanford Avenue W. to City Line	1073'	8"

The Division section crews carried on, as far as conditions would permit, their regular inspection, maintenance and repairs on gate valves, hydrants and pressure regulators throughout the system.

Belleville Reservoir was bypassed on May 27, 1937 for microorganisms. The reservoir was drained and cleaned and the outlet gates serviced. After filling and sterilization the reservoir was back in service on July 6, 1937.

South Orange Avenue Reservoir was bypassed for treatment on November 8, 1937 and after sterilization was back in service on November 18, 1937.

New Wallace and Tiernan chlorinating machines were installed during the year at Belleville Reservoir and South Orange Avenue Reservoir. These machines are served by one-ton chlorine containers.

One major break occurred during the year. Early on the morning of May 28, 1937 a section of 30-inch cast iron High Pressure main failed on South Orange Avenue between Littleton Avenue and Fairmount Avenue.

A shut off was effected by Division of Water forces as quickly as possible but the street pavement of granite block heaved badly and numerous cellars and stores were flooded resulting in great inconvenience and some damage to merchandise.

Repairs, started immediately, were completed the following day and the main placed back in service.

The regular weekly inspection and maintenance of all recording instruments and gauges was continued during the year.

All records were kept, up to date, as usual during the year.

During the week of July 8, 1937 exceptionally high temperatures of 100 degrees prevailed, which together with unauthorized use of fire hydrants throughout the distribution system, caused unusually high consumption of water.

An all-time, record-high daily consumption was observed for the twenty-four hour period ending midnight of July 9, 1937 amounting to 63.3 m.g. with peak rates of 117.3 million gallons per day.

DISTRIBUTION SYSTEM

The total length of pipe owned by the city is now 542.94 miles in the low pressure system and 23.00 miles in the special segregated high pressure fire system. Connected with the mains in the low pressure system are 4,300 fire hydrants and in the high pressure system 301. There are 8,521 gate valves which control the flow of water in the mains of the low pressure system and 270 gate valves controlling the flow of water in the high pressure system. There are 71,510 connections, known as services in the low pressure system of which 54,465 are in use. Through these, water for domestic, commercial and public use is drawn. There are 300 connections in the high pressure system, of which 275 are in use. The water pressures in the low pressure system range from 30 to 130 pounds and in the high pressure system from 100 to 100 pounds per square inch.

STREET MAIN EXTENSION, LOW PRESSURE SYSTEM.

The total extension to street mains in the city during the year 1937 was as follows:

30,016 lineal feet - 5.605 miles from 6" to 30" diameter.

The amount of work done in relaying was as follows:

27,273 lineal feet - 5.165 miles from 6" to 30" diameter.

The total amount of pipe of different diameters, deducting old pipe taken out and adding new pipe of larger size in place of the old pipe removed, consists of 3,030,201 lineal feet or 542.94 miles.

The number of low pressure taps made during the year was 156. Of those 75 were of 1-inch diameter, 16 of 1-1/2 inch, 30 of 2-inch, 6 of 3-inch, 9 of 4-inch and 30 of 6-inch diameter.

The total number of low pressure taps in the city at the end of the year 1937 was 71,510, while the number of taps in actual use was 54,465. The difference shows the services installed in advance of street pavements.

During the year 173 low pressure hydrants were set. Of these 77 were replacements of old hydrants, and 96 were additions to the number already in place;

17 hydrants were taken out and not replaced, making the total number of hydrants in the low pressure system:

In the City.....	4,351
Silver Lake Section and Belleville..	<u>48</u>
	4,399

EXTENT THIS EXTENSION, SPECIAL ESTIMATED HIGH PRESSURE FIRE SYSTEM.

The extension of high pressure mains during the year 1937 was as follows:

575 lineal feet - 0.109 miles 8" Diameter.

The total amount of high pressure pipe of different diameters on December 31, 1937 was as follows:

152,034 lineal feet - 28.00 miles.

The total number of high pressure taps in the city at the end of the year 1937 was 309, while the number of taps in actual use was 275. The difference shows the services installed in advance of street improvement. The number of high pressure taps made during the year was 2.

During the year 1 high pressure hydrant was set, 1 taken out, making a total of 391 high pressure hydrants in the city.

Mr. Frederick G. Scherer, Superintendent of Construction and Maintenance, reports that during the year 1937 6 breaks on mains were repaired and a total of 4451 leaks, covering mains, hydrants and services were investigated and when necessary, repairs were made. Low pressure complaints investigated totaled 1651. There were 509 services cleaned out at the main, 5070 curb boxes set or repaired and 261 curb stops replaced. A total of 2069 hydrant repairs were made, this high percentage of the entire system being accounted for by improper and unauthorized use.

Mr. Arthur E. Stumler, Chief Plumbing Investigator, in charge of the Bureau of Inspection reports as follows:

Four (4) special investigations were made by the Bureau of Inspection of buildings and plants where illicit distilleries were raided by the Federal Authorities.

Surveys and drawings of the water pipe layouts in manufacturing plants

and service connections to buildings are being made and records in the form of maps are being completed and brought up to date for use by the Division of Accounts. Thousands of dollars of omitted accounts are now being added to the records. Water services marked in ledgers "dead or water off" have been found alive and in use. In addition thereto special investigations were made of 804 unwatered high and low pressure fire supply water systems, some of which were discovered to be in general use. Inspection is made of all new services as to their proper installation, also of all repaired and relaid services. Inspection fees for this work for the year 1937 was in amount of Five Hundred and Eighty-nine Dollars (\$589.00).

The builders water return receipts amounted to Six Hundred and Nine Dollars and Eighty-four Cents (\$609.84) and 235 demolitions were reported to the Division of Accounts for their records of turn off.

There were 150 complaints investigated that were reported by property owners and by licensed plumbers, that handy men and unlicensed plumbers were tampering with the water meters and installing or repairing water piping and digging at curb water boxes without proper sidewalk permits.

In addition to the above the following work has been accomplished during the year:

Out of Town Meter Readings.....	1,196
Meter Inspections.....	805
Service Inspections.....	509
Special Investigations.....	4,406
Special Readings.....	322
Mason and Building Inspections.....	4,613
By-passes Sealed.....	83
Unwatered Fire Service Inspections.....	804
Tap Inspections.....	113
Surveys and Drawings - 70 - covering...	424 Taps

Twenty-three (23) water meters supplying other municipalities were read weekly.

Special investigations were made of industrial plants and properties along the river front, to locate foreign water connections between the city water supply and private systems. Thirty-two (32) such connections have been found and removed.

METER LABORATORY

The Meter Laboratory located at 332 South 8th Street, Newark, N.J. is responsible for the servicing and proper functioning of every water meter on Newark water lines. It also keeps an invaluable record of each meter, giving in detail, its location, size, make and number and a record of all tests, repairs and charges from the original date of purchase, until it is scrapped.

The staff on December 31, 1937 consists of 26 men made up of clerks, repairmen, mechanics, chauffeur and laborers, covering office, shop and field work.

There were 7,160 meters serviced in varying degrees and covering the range of sizes and makes in service, a detail of which work follows:

- 161 damaged by frost
- 1,000 stuck (various causes)
- 150 damaged by heat
- 1,433 miscellaneous tests
- 1,033 inspections
- 66 special readings
- 13 periodic tests on premises
- 477 minor repairs (glass, lids, etc.)
- 702 leaks stopped

In addition thereto 303 new meters were tested and 323 meters were disassembled and condemned due to excessive wear, damage and obsolescence.

The stock room continued to function satisfactorily during the year. Meter parts and general supplies are in charge of one man, who is responsible for their disposition and replenishment. He is also charged with the receiving of all material and the handling of shipping when necessary. All drafts made on the stock room must be properly accounted and charged for, preventing pilfering and enabling us to anticipate our requirements more accurately. This also precludes running out of necessary parts and materials.

The Zone system of work distribution was begun in April of this year and while it has not always been possible to follow the system to the letter because the bulk of jobs for the most part emanate from the Zone the meter readers may be covering at the time, it may be said, however, that the idea has resulted in crews becoming familiar with every phase of meter work in the field. It was necessary to purchase new equipment, such as pumps, multiple orifice valves, hose, etc., since but one truck had such equipment up to that time.

We are far behind schedule in "periodic tests" of 5/8" and 1" meters because of the volume of current work. To make any appreciable progress along this line a number of trucks would have to be assigned exclusive of current work. Here up to date test equipment should be used and tests of shorter duration resorted to.

Two of our present test standards are very old and will require replacement. When that time comes it might be well to consider replacing these meters with test tanks of a type at present on the market. These tanks, made of aluminum, are portable and of known capacity with a gage glass at the front from which readings may be taken as required. As there are no moving parts the possibility of their becoming inaccurate due to use, is remote. The time necessary to set up for test, less than that required using a test meter, since there are no hose connections, would enable a crew to test a greater number of meters than now obtains and the disposal of water would be simplified. In any event it would be advisable to secure such a device on trial when we could make an all around comparison with our present test equipment.

Periodic field testing of meters, 2-inch and larger, was continued during the year by a special crew and when time permits periodic testing of smaller meters is carried on by the regular Meter Laboratory forces.

The card system, listing the names and signatures of licensed plumbers, functioned satisfactorily during the year. This offers a complete check on the handling of all meters either new or reconditioned, over the signature of a regular licensed plumber, which is required under our rules and regulations.

A check and inventory of all water meters in service, inaugurated in April of 1936 was continued throughout the year. Accounting ledger records are being checked against Meter Laboratory records and Meter Readers' field binders.

Cooperation has been continued through conferences with and exchange of weekly reports between the Accounting Division, including meter readers and investigators, and the Meter Laboratory and meter testing crews.

CONSUMERS' ACCOUNTS covering METER READING, BILLING AND COLLECTING, are included in a separate report submitted by the Chief Accountant of the Department of Public Affairs.

TABLE 1.

CONSUMPTION STATEMENT FOR YEAR ENDING DECEMBER 31, 1937.

1937	Total consumption for month - million gallons - Newark, Belleville, Villie, McClellan, Elizabeth, Rye, Hackensack, Elizabeth Water Company - Verona.	Average daily consumption - million gallons - Newark and Suburbs.	Total consumption per month - million gallons Newark.	Average daily consumption - million gallons Newark.	Average temperature - Newark.	Rainfall - inches Newark.
MONTH						
January	1690.9	54.8	1336.0	43.9	33.8	9.43
February	1543.0	53.1	1232.0	43.3	33.8	2.96
March	1706.1	53.0	1434.2	43.3	36.1	2.16
April	1647.0	54.9	1367.0	46.6	52.1	7.25
May	1734.2	56.3	1401.6	47.3	64.0	3.51
June	1621.3	60.7	1515.2	48.9	72.6	6.47
July	2013.9	65.0	1608.2	54.7	79.4	2.31
August	1899.4	64.3	1656.0	53.4	76.6	6.40
September	1867.1	62.2	1559.9	51.9	64.3	4.75
October	1803.0	63.2	1499.3	48.4	55.1	6.72
November	1672.5	53.7	1376.9	43.9	44.6	3.73
December	1702.3	54.9	1424.3	43.9	33.3	2.17
Total	21243.1	637.9	17680.7	579.7	634.1	57.64
Average	1770.3	53.2	1471.7	48.2	54.5	4.82

Estimated Population of Newark by Board of Health-December 31, 1937 430,000
 Estimated Population of Town of Belleville, - December 31, 1937 30,000

NO. 1511

	1	9	3	7
January	80.3	100.3	1134.3	2.1
February	84.5	100.3	114.7	2.1
March	88.0	100.3	127.3	1.3
April	88.7	100.4	120.3	1.4
May	81.4	100.7	120.3	1.4
June	80.3	100.7	120.3	1.4
July	87.1	100.3	141.9	1.3
August	80.3	115.1	157.3	1.3
September	84.3	114.3	151.3	1.3
October	88.3	100.3	144.3	1.3
November	84.0	100.1	119.3	1.3
December	44.0	104.0	150.3	1.0
TOTAL	628.0	1204.0	1503.4	17.7
	57.4	57.0	15.4	300.4
	7001.5	13437.7		

DEPARTMENT OF PUBLIC AFFAIRS
DIVISION OF WATER
NEWARK, NEW JERSEY

WATER SUPPLY STATISTICS
For Year Ending December 31, 1937.

Population by census, 1930.....	440,000
Date of construction.....	1903-1931
By whom owned.....	City of Newark
Source of supply.....	Pegannock and the Passaic Watersheds
Mode of supply.....	Gravity

STATISTICS OF CONSUMPTION OF WATER

Population, City of Newark.....	450,000
Consumption, for the year, City of Newark.....	17,660.7 m.g.
Consumption, for the year, Town of Belleville.....	635.0 m.g.
Consumption, for the year, Town of Bloomfield.....	1,864.0 m.g.
Consumption, for the year, Town of Elizabeth.....	1,380.4 m.g.
Consumption, for the year, Township of Wayne.....	15.4 m.g.
Consumption, for the year, Passaic Lake.....	37.4 m.g.
Consumption, for the year, Elizabethtown Water Company.....	17.7 m.g.
Consumption, for the year, Verona, Overbrook Hospital.....	27.0 m.g.
Total Consumption for the year.....	21,843.1 m.g.

Passed through meters in the city.....	15,056.8
Percentage of consumption metered in the city.....	69.25
Average daily consumption, city and suburbs.....	59.2 m.g.
Average daily consumption in the city.....	43.2 m.g.
Gallons per day to each inhabitant in the city.....	103.24
Gallons per day to each tap in use in the city.....	600.33
Cost of supplying water per million gallons figured on total maintenance.....	\$77.60
Total cost of supplying water per million gallons figured on total maintenance, plus interest on bonds.....	\$123.07

STATISTICS REGARDING DISTRIBUTION SYSTEM

Mains, Low Pressure System

Kind of pipe.....	Cast Iron and Steel
Sizes from.....	4-inch to 6-inch
Extended.....	30,167 feet during year
Total now in use.....	343.94 miles
Number of hydrants added during the year.....	90
Number of hydrants discontinued during the year.....	17
Number of hydrants replaced with new or reconditioned hydrants.....	77
Number of public hydrants now in use.....	4,399
Number of stop gates added during the year.....	32
Number of stop gates now in use.....	3,521
Range of pressure on distributing mains.....	30 to 130 lbs.

Mains, High Pressure System.

Kind of pipe.....	Cast Iron
Sizes from.....	6 inch to 30 inch
Extended.....	573 feet during year
Total now in use.....	23.00 miles
Number of hydrants added during the year.....	1
Number of public hydrants now in use.....	301
Number of stop gates added during the year.....	0
Number of stop gates now in use (Revised list over system).....	270
Range of pressure on high pressure system.....	100 to 160 lbs.

Services, Low Pressure System.

Kind of pipe.....	Lead, Brass and Cast Iron
Sizes from.....	5/8-inch to 6 inch
Total number of services in the City, January 1, 1937.....	71,474
Total number of services added during 1937 (5/8" to 6" diameter).....	156
Total number of services abandoned during 1937.....	120
Total number of services in City, January 1, 1938.....	71,510
Total number of regular services in use January 1, 1938.....	53,656
Total number of regular services in use metered January 1, 1938.....	33,474
Total number of regular services in use unmetered January 1, 1938.....	20,182
Percentage of regular services in use metered, January 1, 1938.....	60.22%
Total number of fire line services in use January 1, 1938.....	800
Total number of fire line services in use metered January 1, 1938.....	93
Total number of fire line services in use unmetered January 1, 1938.....	716
Percentage of fire line services in use metered January 1, 1938.....	11.50%

Connections, High Pressure System.

Kind of pipe.....	Cast Iron
Sizes.....	1-1/2-inch to 6-inch
Number of connections added during the year.....	2
Number of connections in the city.....	300
Number of connections in use (1-1/2-inch to 6-inch).....	273
Number of meters added.....	1
Revised list of meters now in use.....	120
Percentage of connections in use metered.....	43.64%

ANNUAL REPORT
OF THE
BUREAU OF ENGINEERING
(DIVISION OF WATER)
FOR 1937

BUREAU OF ENGINEERING

JAMES E. CARPENT

RESIDENT ENGINEER

and

GENERAL PLANNING

U.S.A. PROJECT TO RECONSTRUCT PEQUANNOCK LINE TO BELLEVILLE RESERVOIR - Works Progress Administration Project #3-110, approved November 15, 1935, for reconditioning the portions of the two original Pequannock transmission aqueducts between Broad Street, Bloomfield and Belleville Reservoir was continued again during the year 1937. As in 1936 when reconditioning was carried to a point about 10,000 feet from Belleville Reservoir, the work consisted of cleaning the interior walls of the steel pipe and applying a bituminous enamel lining. "Bitumastic" Regular Enamel made by the Wallace Dove-Hermiston Corporation, New York City, was used. Work was confined to the 48-inch so-called No. 2 Line. The lining work was suspended between July 7th and September 29th when temperature and humidity conditions made it difficult to dry the steel surfaces properly for the application of the heated enamel, and when it was considered necessary to have the line filled and ready for service as a reserve for summer peaks of demand and emergency. As of December 31, 1937 a total of 19,340 feet of the line was enamelled; all but about 230 feet of the section of the No. 2 pipe to be reconditioned.

48-INCH PIPE, BELLEVILLE RESERVOIR TO SECOND RIVER - CONTRACT 36 - Study of other steps in the Pequannock Aqueduct Program, continuing during the spring and summer of 1937, resulted on September 22nd in the receipt of bids for the construction of 4000 feet of 48-inch aqueduct between Belleville Reservoir and Second River to supplement the two existing 36-inch lines comprising this portion of the transmission lines from Belleville Reservoir to the Bloomfield Avenue Tower. Bids were received on several alternate types of pipe including

electric-welded steel joined by riveted joints or Dresser couplings and reinforced-concrete pressure pipe. Four bids were received, the lowest being that of W.L. Harrison & Son, Inc. for \$73,735.00 for 48-inch electric-welded steel pipe joined by Dresser couplings. Contract was awarded to the lowest bidder on October 6, 1937 and fabrication of pipe began immediately. Pipe-laying work started early in December and at the end of the year 1400 feet of pipe was laid and 1100 feet of trench was backfilled.

48-INCH AQUEDUCT - TOWER TO NORTH ORANGE AVENUE RESERVOIR - With the idea of utilizing W.L.A. facilities to inaugurate, within the limits of the City of Newark, essential pipe line construction work embodied in the Pequannock Aqueduct Program, project application was prepared for 12,000 lineal feet of 48-inch aqueduct from Bloomfield Avenue Tower to North Orange Avenue Reservoir. Study of location continued during the summer. In October, 1937, a revision of the project application was submitted to the W.P.A. for the construction of a section of the above mentioned aqueduct, approximately 5600 feet long; the City to furnish the pipe, engineering, inspection and equipment for laying, and the W.P.A. to do the excavating, pipe laying and backfilling. On September 7th, bids were received for borings along the proposed location. Two bids were received, the lowest being that of A.J. Connolly for \$3,075.00. Contract 33 for this work was awarded to Connolly on September 22nd. Borings to determine depth to rock were started November 10th at the Tower and continued south on North Seventh Street. As of the end of the year, 41 borings 15 feet deep were drilled, and one deep boring at a tunnel shaft site on the north side of the Delaware, Lackawanna and Western Railroad was being drilled. Approval of the pipe laying project by W.P.A. was pending at the end of the year.

48-INCH ALTERNATE WITH A COMBINATION AQUEDUCT - Except for the fact that decisions as to acceptable types of pipe and specification for the 48-inch aqueduct Contract 33 established precedent for use when and if pipe be pur-

changed by the City for the 60-inch Alexander Avenue Connecting Aqueduct, no progress was made during the year on this portion of the proposed alternate path for conveying water from Cedar Grove Reservoir to the Bloomfield Avenue Tower via Belleville Reservoir. Laying of the proposed aqueduct as Works Progress Administration Project No. 3-7-336 was approved September 9, 1936 but use of available City funds for other essential work as heretofore described has made it impossible for the City to go ahead with this project. Federal funds to the amount of \$103,000 have been set-aside for this work, contingent upon the City's commitment of \$104,000.

TESTS OF PIPE LINES, AQUEDUCT-TRANSMISSION WORK - Extensive tests were made during the year 1937 of pipe lines previously reconditioned or to be reconditioned as part of the Program of Pequannock Transmission Aqueduct Work. During April the 42-inch No. 2 line between Macopin and Lompton Hatch with its new cement-mortar lining was tested several times in its entirety, as well as in its various parts having various thicknesses of cement-mortar lining. Carrying capacity was found to be apparently the same, irrespective of thickness of lining; the thicker lining, which reduced the net area of waterway in the pipe, lessening the friction and interference along the walls of the pipe by submerging the rivet heads more completely at joints. A coefficient of 135 in the Hazen and Williams formula for flow of water in pipe lines was found.

In September flow tests were made of the section of the 42-inch No. 2 Pequannock line between Broad Street, Bloomfield and Belleville Reservoir, a considerable portion of the line at that time having been lined with hand applied bituminous enamel. Tests indicate a value of Hazen coefficient of 130 to 135 for the 42-inch pipe with "Automatic" enamel lining.

Observations of flow and pressures in the 36-inch cast-iron so-called No. 3 line, between Bloomfield Avenue Tower and Belleville Reservoir made during October, November and December 1937 established the fact that the Hazen C of this pipe in its existing condition after 37 years of use is about 85. Cleaning of this line is one of the steps of proposed work to provide an al-

terminate path for water from Cedar Grove Reservoir via Belleville Reservoir to the City.

SUPPLY TO OTHER MUNICIPALITIES

Belleville - In January 1937, the Town of Belleville having laid a new 12-inch main on the south side of Belleville Avenue, application was made by the Town for a new connection to this main from the 36-inch cast-iron No. 5 line of the City of Newark at Garden Street. Eight-inch water and pressure regulator were installed. The connection to the 12-inch line is to support the pressure in the low-level portion of the Belleville distribution system. As of the end of the year this connection has not yet been put in service although water was turned on, on August 4th, to permit of adjustment and setting of regulator.

Tutley - Suit in Chancery asking that the Contract between the Town of Tutley and the Passaic-Tutley Water Commission, effective March 1, 1936 for a water supply for the Town, be voided, did not progress far during the year 1937. Motion of December 29, 1936 to strike the Bill of Complaint of September 21, 1936 was denied by Vice Chancellor Vivian H. Lewis on July 8, 1937. This matter is not yet at issue.

OPERATIVE STATUS

Flushing - In spite of routine flushing of dead ends and areas where dirty water tends to accumulate, complaints of dirty water became so general, as water temperatures rose late in May, as to require a special program of intensified flushing which continued until the middle of June. Another interruption of routine flushing occurred late in August when all flushers were taken off of flushing work to perform special hydrant inspection work made necessary by unauthorized use of hydrants as shower baths for relief from the heat. The routine flushing as during the previous year included 21 groups of dead-ends containing 301 dead ends and 10 lists of 21 areas in the vicinity of laundries and other locations where dirty water tends to accumulate requiring the operation of 200 hydrants.

Great Notch Regulator - The lack of capacity in the 60-inch Bloomfield Avenue supply main from Cedar Grove Reservoir was evident with possibilities of serious consequences on July 8, 1937. Regulator at Great Notch with setting of about 25 pounds per square inch on the outlet side was not able to support a pressure of 90 pounds at the Tower while literally hundreds of hydrants were opened promiscuously and without authority all over the City to provide relief from heat. Efforts to raise the pressure in the City by increasing the pressure on the outlet side of the Great Notch Regulator simply provided more water to be wasted at hydrants. Filling of South Orange Avenue and Belleville Reservoirs could not be started as usual during the evening of the 8th. There was concern as to whether these reservoirs could be filled before morning. The situation was finally gotten under control with regulator set to support a pressure of 35 pounds at Great Notch. This setting was reduced to 30 pounds on July 19th following an interruption in the regulator's operation due to the lodging of two blocks of wood between the valve and its seat. On September 15th setting was again reduced to about 25 pounds and by the first part of October consumption in the City had decreased to the point where the support of this regulator was no longer needed regularly. Early in November, when South Orange Avenue Reservoir was by-passed for cleaning, the Great Notch regulator again opened at times of heavy draft.

Hydrant Sprinklers - Permission to use a hydrant with a sprinkler-shower attachment under proper supervision for street bathing during the hot days of summer were issued to 115 persons during June, July and August 1937. Five permits were revoked because of abuse of the privilege. Preparations for issuing of permits began early in June in anticipation of the closing of schools. Permits were for the period July 1st to September 10th. On this latter date all hydrant attachments were recalled. Again, as in 1936, there was gross abuse of the privilege and hydrants were used extensively, at times, without shower attachments.

Wanaque Water - In addition to its regular use through the 60-inch supply line to the down-town section of Newark, Wanaque water was used through the 30-inch connection at Belleville Reservoir, during the period May 27 to July 6, 1937, by-passing the reservoir for copper-sulphate treatment on May 27th and again on June 4th, and for emptying and cleaning during June.

Until August 11th Wanaque water was taken from the so-called Intermediate Intake which provided excellent quality and low temperatures. From August 11th to the end of the year, part of the supply from the Wanaque Reservoir was taken from the Upper Intake.

The North Jersey District Water Supply Commission called together all Wanaque partners on June 15th to hear again the protest of the Passaic Valley Water Commission to the North Jersey Commission's formulae for the division of surplus revenues from the sale of Wanaque water to the City of Bayonne in which revenue Newark has the largest interest. Following this meeting on September 14th the North Jersey District Water Supply Commission filed a petition in the Supreme Court under the Declaratory Judgment Act asking for the court's interpretation of the statutes and contracts applicable to the matter in controversy. On November 24, 1937, before Vice Chancellor Lewis the Passaic Valley Water Commission on behalf of the Cities of Paterson, Passaic and Clifton made application for an order to restrain the suit in the Supreme Court and asked that Chancery Court settle the question at issue.

Miscellaneous Studies - Studies were made in the spring of 1937 for re-roofing the residence of the Attendant at Belleville Reservoir. Contract for the work was let in the fall and by the end of the year the work was about 50 percent completed.

Tentative layout of a water-treatment plant in the Oak Ridge Reservoir outlet channel indicated that the proposition was impracticable.

In connection with Distribution System main-pipe work studies were made of 4-inch and 6-inch replacements, crossing of Peddie Ditch with 20-inch low-pressure main, and mortar encasement of mains in Port Newark area; and

specification for bituminous-enamel for lining cast-iron pipes were prepared.

Surveys and maps were made of swamp areas and ponds on the Pequannock Watershed, those of swamps being for study of drainage thereof and those of ponds for purpose of computations of quantities of water contained therein and requiring copper sulphate treatment from time to time. Earl, Charlottsburg, Dunker, Tallman, Cedar and Buckabear Ponds were surveyed.

During February and March 1937 inspections were made of the dams forming the various Pequannock Reservoirs and minor repairs were made as a result. Continuing preliminary work in connection with a possible future valuation of the Pequannock Supply, computations of quantities of the various items of work in the reservoir structures were made from January to April 1937.

Costs of supplying water in Newark and other municipalities were computed.

In connection with agitation for legislation for a State Water-Supply Authority or Commission a meeting was called in Paterson late in March by the Passaic Valley Water Commission in opposition to such legislation; shortly thereafter the Town of Bloomfield called together a group of municipalities in favor of state action, and on December 22, 1937 at Trenton a conference of all interested parties was held. No legislative action was taken.

PHOTOGRAPHIC LABORATORY

The work done in the Photo Laboratory during the year 1937 was less than for the previous year by reason of the fact that work in connection with the investigation of the 1935 actions of the City Commissioners was less. At the rates charged by commercial studios the value of all work done was about \$12,000 compared with \$18,000 in 1936. The cost of supplies and services for this work was \$8,983, only slightly less than the 1936 cost. Work for the Division of Water, which bears the entire expense of the photo laboratory amounted to about \$920.

RECORDS

Pequannock Properties - Maps of the individual city-owned properties on the Pequannock Watershed were about 85 percent completed at the end of 1937. Property lines were surveyed on approximately 50 tracts of land for purposes of planting, reforestation, swamp drainage and encroachments.

Survey of pipe-line right-of-way from Belleville Reservoir to Macopin Intake is still in progress. Only a small amount of time was given to it, because of more important work. Individual right-of-way conveyances are to be tied in to this survey.

Tax appeal filed against Town of Clifton was defended and reduction of \$1950 was obtained.

Ten (10) acres of land located on River Road, Belleville, a portion of the old Passaic River Pumping Station property, was turned over to the Essex County Park Commission.

Foreclosure proceedings on the William F. Penney and E. R. Greenwood tracts on which the City holds tax title certificates, eviction suit against Stephen Bailey on the Augusta Boyd tract, and efforts to clear up outstanding tax-title certificates against the Estate of John Rutherford were continued during 1937.

Approximately 200 monument-stones were set by C.C.C. crews and engineer along roads in the watershed to indicate boundaries of city-owned properties.

Operating Maps - Operating maps and records were revised and expanded from time to time during the year to keep up with changes in the system.

Water Statistics - Tabulations of rainfall, run-off, evaporation, temperature, water consumption, chemical characteristics of water and other statistics pertaining to the water-supply were kept up to date and in form for distribution to interested parties.

A pamphlet describing the water-supply system was revised, new lantern slides were made to bring up to date the set available for illustrated description of the supply, and a display of some size illustrative of the entire works was prepared and exhibited at meetings of the New Jersey Master Plumbers Association and of the New Jersey Section of the American Water Works Association.